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A COMPACT PANORAMIC RADIO SPECTROSCOPE

ADAPTER.

(Taken from an article by George Crammer W1DF,
published in QST).

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Several months back we published some details of a "panoramic radio spectroscope" for use with communication receivers. This system has evidently aroused considerable interest and we have been asked for further details. A description of a "panoramic" adapter was published in QST for July and the following information is taken from this article. At first glance the circuit appears rather formidable, but it can be readily resolved into sections which are in themselves comparatively simple. The panoramic adapter to be described uses a 902 two-inch oscilloscope tube and, with the exception of the special RF transformers, the other components are easily obtainable and consist largely of tubular condensers and resistors.

CIRCUIT OPERATION...The complete circuit diagram is shown in Fig 1. Some of the output from the mixer tube in the receiver is fed to the first transformer T1, in the adapter unit through an isolating resistor R1, which is of high value to eliminate detuning and heavy loading. The 6S37 is a straight amplifier with the output transformer T2 tuned to the same frequency as T1, which is at the I.F. frequency of the receiver.

These transformers are both tightly coupled so that there is little attenuation for signals within 50 KC either side of the frequency to which the receiver is tuned. This requires more than simply adjusting T1 and T2 to give a flat-topped band 100 KC wide. A receiver having one RF stage has two circuits tuned to signal frequency and the selectivity of these circuits is such that a signal 50 KC off resonance will suffer considerable attenuation. At low frequencies the discrimination against a signal 50KC off resonance will be great but this would be considerably less at say 14MC.

The ideal condition is that which results in minimum amplitude discrimination from the antenna to the mixer in the adapter circuit.

Therefore T1 and T2 must be adjusted to compensate for the selectivity of the RF circuits in the receiver. Since the RF circuits will boost signals at the center of the band and attenuate those at the edges, T1 and T2 must be adjusted to have a stage selectivity characteristic which has a dip at the center and shows distinct peaks 50KC either side of the center. In practice such compensation can be secured at only one frequency, since the RF selectivity varies with frequency. In practice compensation is made practically 100% in the 3 MC region, accepting the unavoidable undercompensation at low frequencies and overcompensation at higher frequencies.

The gain of the first stage in the adapter is controlled by R2 which is needed to prevent the stronger signals from exceeding the limits of the cathode-ray tube screen and to compensate for variations in RF gain in the receiver.

POWER SUPPLY ... The power supply is somewhat unconventional as it uses a full wave voltage doubling circuit grounded at the center, thus giving the correct plate voltage for both the amplifier tubes and for the cathode-ray tube. Only a single winding delivering about 300 volts AC is required on the transformer.

OSCILLATOR FREQUENCY MODULATION...The oscillator circuit used is a Hartley operating at a center frequency of about 356KC (actually the receiver intermediate frequency minus 100KC) this frequency is varied plus and minus 50KC by the 6AC7 reactance modulator. The reactance modulator is of the variable inductance type, the RF control voltage for the grid being taken across C17. The low frequency control voltage (sweep) for the modulator is applied across C19 through isolating resistor R42 to the grid of the tube. The amplitude of the sweep voltage and hence the frequency band covered by the oscillator is adjusted by the sweep control potentiometer R35.

I.F. AMPLIFIER...The IF Amplifier is tuned to 100 KC. The transformers are designed so that the band-pass is something less than 10KC. The greater the selectivity of this circuit the higher the "resolution" of the system--that is, the ability to show as separate peaks on the cathode-ray tube screen signals differing in frequency by only a few kilocycles.

The 100KC output of the IF amplifier is applied to one diode plate of the 6SQ7 final detector. The rectified output voltage of the diode is applied to the grid of the triode section of the tube through R14. The triode section thus acts as a DC amplifier and is biased by the rectified voltage from the diode. Headphones can be plugged into J1 for audio monitoring.

SWEEP GENERATOR...The sweep generator uses double triode 7F7, one section being used as an oscillator and the other as an amplifier. The oscillator circuit is the ordinary feed-back

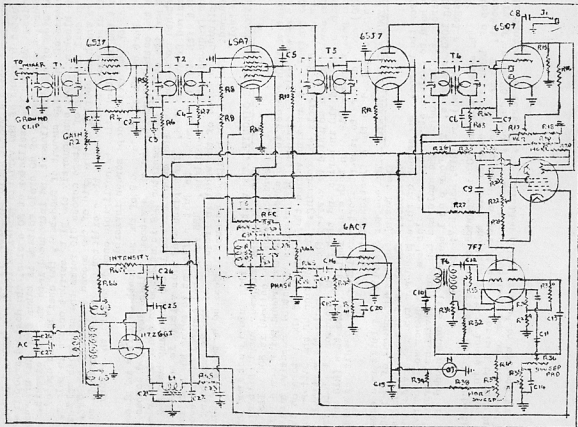
arrangement using a midgot audio transformer, the frequency being adjusted by means of the variable grid-lock formed by R33 and R32 in series. To lock the oscillator at 30 cycles, the desired sweep frequency, a small amount of 60 cycle voltage is taken from the ungrounded side of the 7F7 filament and introduced into the grid circuit. Because of the large amount of feed-back, the oscillations are of the blocking type, consequently the plate current occurs in pulses. A gradual build up of voltage across C10 forms the saw-tooth voltage wave which is coupled to the grid of the second section of the 7F7. C10 discharges rapidly when the oscillator draws plate current, so that the 'fly-back' time is negligible enough to make the return trace on the oscilloscope screen invisible.

Part of the plate load R29 of the saw-tooth amplifier is placed in the cathode circuit, and the saw-tooth voltage developed across it and the cathode bias resistor R28 is utilized to control the reactance modulator and thus sweep the oscillator frequency over the desired frequency band. The amplitude of this voltage is adjusted so that with R35 at maximum it is just sufficient to swing the oscillator frequency over a 100KC band. R35 is a panel control of the sweep amplitude and hence of the width in frequency of the Rf band being scanned. The band can be spread as much as desired by means of this control.

CATHODE-RAY TUBE CIRCUIT...The voltage for this tube is obtained by connecting the two power supply filters in series. Thus the cathode is 300 volts negative with respect to the chassis and the ground point comes midway on the voltage divider. R27 supplies adjustable negative bias for the control grid and thus varies the intensity of the pattern on the screen. R22 controls the focusing. The position of the pattern on the screen can be adjusted by varying the voltage to the vertical plate by R17 and R18 in series and that for the horizontal plate from the potentiometer R19. In both cases isolating resistors (R16 and R20) are necessary to prevent short circuiting the AC voltages which are also applied to the deflection plates.

LAYOUT AND CONSTRUCTION...The adaptor described was built in a cabinet having outside dimensions of $7\frac{1}{2} \times 10 \times 4\frac{1}{2}$ inches. The chassis base is $1\frac{1}{2}$ inches from the bottom. The screen of the cathode-ray tube is provided with a hood to exclude stray light and also has a frequency scale mounted across the lower edge. The scale has ten equal divisions representing 10KC intervals. The four panel controls (the ones needed in regular operation) are R19, R35, R47; and R2.

The socket for the 902 is mounted on a vertical metal plate the top of which is bent over to cover the high voltage leads to the socket. The socket is mounted so that it can be rotated through an arc of about 20 degrees, so that the deflections can be made actually horizontal and vertical. A shielded cable is used to connect the



C1,2,3,4,5 :		C17.....30mmfd Mica
C8,15,20,26 :---	0.01mf, 600v	C18.....1-10mmfd mica pad
C27.		C19.....250mmfd Mica
C6,c7,C14.....	500mmfd Mica	C21,22,23.....
C9,C13.....	0.05mf 400v	10mf electrolytic
C10.....	0.1mf 400v	C24,C25.....
C11.....	0.25mf 400v	4mf electrolytic
C12.....	0.01mf Mica	C28,C31.....
C16.....	100mmfd Mica	100mmfd mica (in
		osc unit T5)
		C29.....
		30-240mmfd mica
		(padder (in Osc T5)

C30....	500mmfd mica (in osc unit T5)
R1,16,2 7....	0.25 meg
R2.....	10,000 potentiometer
R3,12 ,34....	200 ohms
R4,43,44....	50000 ohms
R5,29.....	25,000 ohms
R6,7,28,45....	5000 ohms
R8,18,21,23....	0.1 meg
R9,13,14,38,40....	1 meg
R30.....	0.11 meg
R11.....	25,000ohms
R15,R32.....	0.5 meg
R17,35,47.....	0.1 meg Pot
R50.....	25,000 ohms (in osc unit T5)

T1.....RF input transformer 456KC
T2.....RF interstage transformer 456KC
T3.....IF input transformer 100KC
T4.....IF output transformer 100KC
T5.....Oscillator transformer 356KC
T6.....Saw-tooth oscillator transformer
(2:1 or 3:1 midget audio)
T7.....Power transformer 300v, 40 M/a.
L1.....Filter choke 40ma 350 ohms
(app 5-10 henrys)
F.....2 amp fuse
S1.....Toggle switch (on R47)
J1.....Open circuit jack
N.....1/2 watt neon bulb without base resistor
RFC.....30 mh r.f. choke (in osc unit T5)

NOTE:- R26 need only in case horizontal positioning control (R19) is critical in adjustment or total plate voltage exceeds 300, approximately. It may be omitted in this circuit, the junction of R2 5 and R19 being connected directly to B positive.

OF INTEREST: The B.B.C. broadcasts 97 news bulletins each day. During the different broadcasts a total of 40 different languages are used.

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unit to the receiver. This cable has the isolating resistor R1 mounted at its free end so that it will be as near the mixer (in the receiver) plate as possible.

TESTING AND ALIGNMENT...Adjustment of the unit involves a number of operations, but most of them are quite straightforward. First check the power supply. The positive of C22 to ground should be about 300 volts and the same voltage should appear between the negative terminal of C25 and chassis. The total voltage between these two 'high' points should be 600. Screen voltages on the two 68J7 tubes should be approximately 100 (at full gain).

It is a good idea to put the cathode-ray tube and the sweep generator into operation, and these can be used in alignment of the RF and IF stages. The sweep generator should give no difficulty, although it will be helpful to check the shape of the saw-tooth if an oscilloscope is available for the purpose. The saw-tooth should be reasonably straight and the fly-back time or horizontal duration of the vertical part of the saw-tooth, should be very short. Should the oscillator not operate at all (no pattern on the oscilloscope screen) reverse the leads of the plate winding of T6.

With the saw-tooth oscillator in operation apply voltages to the 902. A horizontal line should be obtained on the screen focusing and intensity being adjustable by means of R22 and R47 respectively. Width and position of line are adjusted by means of R37; R19 and R17. Set the line well towards the bottom of the screen, since all vertical deflections will be upwards.

R.F. AND I.F. ALIGNMENT...The IF should be lined up first, using a test oscillator and tuning the trimmers on T3 and T4 for maximum response. At resonance the line on the 902 screen will move upwards and when T3 and T4 are completely in resonance it may be necessary to decrease the test signal to keep the line on the screen. T1 and T2 are lined up using a test oscillator tuned to the intermediate frequency in the receiver. The next step is to adjust the oscillator sweep. With the test oscillator at the receiver IF frequency, say 456KC, and with R36 at about half scale, slowly increase R35 from zero. As the amplitude of the sweep voltage applied to the grid of the 6AC7 reactance modulator increases, the pattern on the cathode-ray tube screen should change, showing the signal as a hump on the horizontal base line, which should move downward to the position it had originally when no signal was applied to the horizontal plates. A suitable height for the signal trace can be obtained by adjustment of the gain control R2.

Should the signal trace not be in the center of the screen or should it move horizontally as the sweep amplitude is increased, adjust C29 while varying R35 until the signal remains fixed in position on the horizontal base line, regardless of the setting of R35. The signal will then not necessarily appear at the center of the screen but then can be adjusted by R19. The phasing control

(C18) is not critical and may be set at nearly maximum capacity.

With the 456Kc signal centered on the screen, tune the oscillator slowly towards 506KC, watching the horizontal movement of the signal trace, R35 should be set at maximum. At 506KC the signal trace should be at the edge of the screen; at 406KC it should be at the opposite edge. The sweep can be set at any desired figure between 100 and zero KC by R35.

In this test the amplitude of the signal trace probably will vary considerably as the input frequency is varied. The final step in adjustment is to align T1 and T2 to compensate for the IF selectivity of the receiver. Set receiver at about 3MC; set test oscillator to same frequency and tune the signal to the center of the screen using the regular receiver tuning control. Then with the test oscillator put the signal at one edge of the screen. Note amplitude as compared to that of the center position and adjust IF trimmers. It will be necessary to compromise between these adjustments.

The frequency modulated oscillator in the unit provides an excellent means for final alignment of the 100KC amplifier. Tune in a test signal to the center of the screen and adjust the trimmers in T3 and T4 to give the sharpest and most symmetrical pattern. The signal on the screen is actually a trace of the selectivity curve of the 100KC amplifier and corresponds exactly to the similar type of trace obtained when aligning an ordinary superhet with the aid of a frequency modulated test oscillator and oscilloscope.

If an oscilloscope with a low frequency sweep is already available it should readily be possible to modify it slightly to make it usable for panoramic reception with an RF--IF unit, thus obviating the necessity for constructing part of the complete circuit. The chief requirement would be to be able to take out a little of the sweep voltage and apply it to the reactance modulator grid, and to provide a straight-through (DC) path to the vertical plates of the scope.

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INDICATING VERY HIGH FREQUENCIES

A common requirement in testing centrimetre-wave transmission gear is to know when the current reaches a definite amplitude. For this purpose it is proposed to make use of the fact that a flash light filament of sufficiently fine gauge, to ensure a uniform distribution of current over its cross sectional area always begins to glow at a critical current amplitude.

In practice a small glow lamp with a straight filament of 0.0004 in diameter is bridged across a current loop in the tuned Lecher wire circuit of a centimetre wave generator and the point at which it first incandesces is observed through a viewing tube which is inserted through a small hole in a metal screen surrounding the generator.

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D.F. DEVELOPMENTS.

For a number of years D.F. Equipment using the directional loop has been used to enable aircraft pilots to determine their positions under conditions of poor visibility. This method, although fairly satisfactory, caused some delay while taking readings.

An apparatus has recently been developed which will determine an aircrafts direction instantly and automatically. It is an Azimuth-indicating radio receiver, which gives visual indication of the direction of the source of any radio waves to which the receiver is tuned.

The antenna system consists of four vertical dipoles located at the corners of a square with a fifth dipole at the centre. The four corner antennae are used for determining direction. The centre antenna serves as a reference of radio frequency phase; to permit differentiation between directions 180 degrees apart. This form of antenna responds only to the vertical component of the electric field, since the horizontal component is cancelled out.

Each pair of directional dipoles is connected to the input of a pair of modulators, which are also supplied with an audio modulating frequency. The carrier and modulating frequency are both suppressed; only the side-bands remain. The outputs of the directional modulators, together with the output of the centre antenna, are then combined and passed to the radio receiver. The three components are separated at the output of the receiver and the signal is fed to a loudspeaker, and the two directional components to the plates of a cathode-ray tube which has two pairs of deflecting plates at right angles to each other. The rectified output of one pair of dipoles tends to deflect the spot along the line of one pair of plates, and the output of the other pair of dipoles along the line of the other pair of plates. The indication on the screen will then be a straight line whose direction depends on the relative strength of directional signals applied to the deflecting plates. If there were only two directional side-bands at the detector input in the radio receiver there would be uncertainty between directions 180 degrees apart. The output of the centre antenna, however, which is present with the two directional side-bands, serves as a reference of sign, with the result that the bearing is correctly indicated at all times during the flight.

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HELP WIN THE WARBUY WAR BONDS AND WAR SAVINGS
CERTIFICATES.

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SLOUCH HATS AND FORAGE CAPS.

By VK2YC.

VK2CX (Evans) now a Pilot Officer in the R.A.A.F. writing from a Victorian station requests news and location of his pal VK2 AGG and through this column also sends his regards to Charlie Miller VK2ADE.

Joe Ackerman VK2ALG, dipping his pen into Darwin ink of Army origin mentions that nothing ever happens up that way (much). He also mentions that VK3RM also ornaments the scenery around that region and that VK3RM is to be congratulated on the advent of a third pip. Joe who by the way is a two-pipper expresses pleasure at the meeting of several W hams who happened along and makes mention of a long ragchew over a bottle of corn liquor, into the wee small hours of the morning. Great dx was undoubtedly worked that night.

Frank Hanham, VK3BJ, a Sergeant in the signals side of the Army and located in N.S.W. was seen recently in Sydney. Previous to the third Sunday in November, Frank was his usual fat jolly self, but on that day met up with one VK3RJ who has again returned to the mother state. On that fateful day Jonah inveigled the trusting VK3BJ into a hiking tour over 16 miles of the Hawkesbury Rivers' rough contours. A good day was had by all, including the flies and skeeters.

QRR QRR VK2PF de VK2YC---vide September QST Page 52.
Please Captain wouldn't you relent? Yes, all enquiries to VK2YC.
Hi!- only send me some news at the same time.

A photo of little Miss 30F shows she may look like the OM. I nearly put "poor kid." ahem! Frank is still training them down at Depot and in between times finds time for a few jobs around his new home at Hampton, Vic.

Alan Furze of VK2HF was last reported amongst those "heading north."

Talking of swimming, Cec Horne VK2AIK says that they have a daily dip off his tropical isle and 2TI wasn't kidding when he said "they post a guard and mount machine guns to keep away the sharks." Of well, Cec said it anyway.

Arthur Evans, 3VQ is doing stalwart work for the R.A.A.F. up Brisbane way and reports all OK..F/ O Frank Goyen in an endeavour to get closer to "Big Charlie" managed to get a posting from Ultimo to Richmond. Nice goin' Frank.

News has come from Peter Vesper 2FV. Peter is up with the mossies and the Japs, dispensing No. 9's. They say they are

bigger and better these days.

Sel Weston, VK2AJH now a P/O in the R.A.A.F. is back enjoying the climate of his home state and city and drags the portable rx around with him. He has a wife too.

What do you know...for the very first time somebody rang up with some news for this column, so you see one person reads it besides the Mag. Committee. You see we had De-moted somebody. Apologies VK3dc...you see we made him a mere 'loot when he is a Lieut-Colonel this many a month. Anyway its fb to know hams reach this exalted height in the Army, too. We do pretty well in the Air Force, I wonder how high we go in the "silent service."

Cec Light 2QM was last seen on leave in Sydney with a list to one side, but closer inspection showed it was only the pair of wings he wears on one side these days. Hope the Commission follows soon, Cec om. 2 QM had a Pilot's Licence before the war and is one of the very few lucky ones to wrangle a way out of the N.S.W. Police into one of the services.

Jack Lumsdaine 2ABQ who was also in the Police over here is now a Yeoman of Sigs in the R.A.N. Jack has seen a good bit of service. Among other places he was in Singapore when the Japs arrived there. After the "Show" he will have some tales to tell.

Now don't forget the address...78 Maloney St., Mascot. N.S.W. Phone MU1092...or to Ray Jones 3RJ R.A.A.F. Pt. Piper.

78 and thanks for them all...2YC

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EMERGENCY COMMUNICATION NETWORK

During the last month considerable progress has been made with the installation of stations at the outlying locations and quite a few of these stations have been testing with Central Control. These tests usually take place at week-ends.

The aerial for the medium frequency transmitter has been erected and is quite a landmark at its location and a great source of pride to the hams that are interested. The medium frequency transmitter has been delivered but as yet has not been tested. This transmitter with its aerial power of 200 watts is quite a fine job and sufficient to bring joy to the heart of any ham no matter how hard boiled he may be.

Once all stations are installed and beams adjusted exercises will be held under conditions approximating those that one could expect during a raid. Of course message handling will play a prominent part and VK hams will be given the opportunity of carrying out a type of transmission that they have been debarred from in the past, viz. traffic handling but more of this anon.

D I V I S I O N A L N O T E S

.. Federal Executive ..

Federal Headquarters has now been located in New South Wales for one year and here is a brief resume of the work carried out during this period.

EMERGENCY COMMUNICATION NETWORK. The most outstanding event in the history of Experimental Radio in Australia to date has been the inauguration of the Emergency Communication Network in New South Wales. The VK2 Division, following upon the ban of transmissions, has been untiring in its efforts to bring under the notice of the Department the value of the Australian Experimenter and his equipment. Undeterred by rebuffs this Division kept at its task and on 14th July 1942 its efforts were crowned with success and the E.C.N. is in full swing in N.S.W. Federal Headquarters took no part in these negotiations but as a result of the VK2 Division making all details available from time to time, it was possible to pass the information on to other States and as a result the South Australian Division has been successful in obtaining permission for a Network in that State.

CENSUS OF COMMONWEALTH EXPERIMENTERS. One of the first decisions made by the Executive upon assuming office in NEW SOUTH WALES was to make a Census of Australian Experimenters in an endeavor to ascertain the part being played by the Amateur in the national emergency. This survey was an unqualified success from many angles. Firstly, the number of cards returned exceeded 50% of the total cards sent on. In all 1823 cards were despatched and to date 923 cards have been returned and even at this stage, nearly twelve months after, they are still trickling in. Secondly, it brought under the notice of VK hams that the Institute was still functioning and as a result many new members were obtained by each active Division.

INACTIVE DIVISIONS. After making a survey of the position of the Institute in each State it was found that in VK5 and VK7 Activities were practically nil. Of course it was fully realised that the smaller States would have some difficulty in carrying on, due to Service calls etc. It was found that Amateurs in these States were still interested in the Institute, but it was impossible to obtain continuity of Office-Bearers. Federal Headquarters discussed this position at some length and eventually it was decided that should any Division request it the Federal Executive would enrol the Members of that Division in a body to be known as the Wireless Institute of Australia. Both VK5 and VK7 made this request but since permission has been granted for the formation of an Emergency Communication Network in South Australia, this State feels that with the reawakened interest, it will be able to manage its own affairs. The Federal Executive appreciates the efforts of "Doc" Barbier 5MD and Peter Allan 7PA to keep alive the Institute in the States concerned.

"AMATEUR RADIO" - during the year negotiations were entered into with the Victorian Division publishers of "Amateur Radio" and the New South Wales Division publishers of the "Monthly Bulletin" with a view of amalgamating the two publications in an endeavor to obtain a magazine worthy of the oldest Amateur Radio organisation in the world. Eventually a basis satisfactory to both States was reached and the combined publication has been acclaimed everywhere.

PRISONER'S OF WAR FUND. During recent months a W.I.A. Prisoners of War Fund was inaugurated and to date the sum of £22/17/- has been collected; and it is believed that further sums are held by Divisions.

CUSTODY OF EXPERIMENTER'S CONTAINERS. During September an instruction was issued by the Department of Security stating that sealed containers at that time in possession of Licensed Experimenters were to be handed over to the Wireless Branch for custody during the war period. Federal Headquarters, whilst agreeing with the principle of this instruction on the grounds that if the equipment were no longer in the possession of the Experimenter, no person could by innuendo suggest that it would be used for Fifth column activities as it had been inferred in the past, nevertheless was of the opinion that any Experimenter desiring to repack his container should be given the opportunity of doing so and that an extension of time be granted for lodgement and that the Wireless Branch should make arrangements for the transport of heavy containers. These requests were made to the Chief Radio Inspector and were granted, and your Executive take this opportunity of thanking both the Chief Radio Inspector and the Senior Radio Inspectors in each State for the co-operation given.

LICENSING OF RADIO SERVICEMEN. Certain proposals for the Licensing of Radio Servicemen were recently brought under the notice of the Federal Executive and although the necessity for the conservation of Manpower is fully realised it was felt that if these proposals were to be adopted in their entirety by the Department of War Organisation of Industry a grave injustice would be done to quite a large number of Experimenters carrying out part time Service work. Briefly the proposals were as follows:- All Radio Servicemen were to be licensed and each Serviceman allotted a definite area and in that area no other person would be permitted to carry out Radio Service work. That only Licensed Servicemen would be permitted to purchase spare parts. That the only persons who would be admitted obtain a license would be members of a certain trade organisation. The injustices of these proposals insofar as the Experimenter is concerned are quite obvious, and it was decided to write the Minister for War Organisation of Industry, pointing out the weaknesses of the scheme with a request that the proposals be modified to include Licensed Experimenters. A reply has been received stating that the points raised will receive careful consideration before any decisions are made.

NEW SOUTH WALES DIVISION

November General Meeting of the Division was held at Y.M.C.A. Buildings on Thursday 18th and the attendance was a very representative one.

The Chairman in declaring the meeting open extended a welcome to Sergeants L. McIntyre VK3XF, and W.P. Burford VK5FF. Also present Pat Kelly and John Thorley VK4RT. The last two mentioned hams at different times occupied the position of Secretary to the VK4 Division.

The report on the activities of the Federal Executive during its first twelve months of office (appearing elsewhere in this issue) was read and unanimously adopted, and the Executive was congratulated upon its fine work during this period.

Donations are still being received towards the Institute's Prisoner's of War Fund and at present the total stands at £13/16/- and it is anticipated that the sum of £15 will be handed over to Federal Headquarters at the end of the Divisional Year, 31st December 1942. It is anticipated that the names of P's O.W. held by the Japanese will be released very soon, and every Member of the Institute is asked to make a perusal of these lists, and if you notice the name of any ham please notify the Divisional Secretary so that he in turn can notify Federal Headquarters, who will arrange for comforts to be sent these hams.

The question of post war activities and the steps to be taken to ensure that the splendid part that is being played by the Australian Experimenter both on Service and in essential industries, shall be brought under the notice of the authorities when the time comes for the removal of the ban on transmissions, the lifting of the suspension of Experimenters Licences and frequency allocations was discussed at some length and it was decided that Federal Headquarters be requested to write both the A.R.R.L. and R.S.G.B. in an endeavor to ascertain the steps taken in America and England.

At the conclusion of general business a very interesting Lecture was delivered by Mr. Norm Hannaford on "Ultra Short Waves." This talk, although of an informal nature, proved to be one of the most educational lectures that have been given for some time and upon conclusion Norm was accorded a very hearty vote of thanks.

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SILENT KEY: Another oldtimer who has gone to meet the Great Brasspounder is Jim Wood VK2ZM of Grafton, New South Wales. Jim was just over 42 years of age and died suddenly on 14th November last. Well known for his quiet and unassuming disposition Jim will be missed by a host of friends in all walks of life.

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V I C T O R I A N D I V I S I O N

The December meeting of the Victorian Division again saw some interstate visitors in the persons of Allan Feitz VK2QE Roger Torrington VK2TJ. Col McDowell and Syd McLean. Three of whom are sergeants in the R.A.A.F.

Doug Norman VK3UC another member of the R.A.A.F. who has just returned from Australia's near north entertained the gathering with a talk of his experiences when the "Sons of Nippon" landed at Salamaua. He and a few other members of the R.A.A.F. (three of which were Hams) were posted there to keep the radio communications intact and to give DF bearings. His description of the first raid were vivid, and their haste to destroy the gear when the Japs landed were very interesting. Doug by the way was lost in the bush for a day without any food. After being six months or more attached to the army in the bush, he eventually arrived back in civilisation with malaria and sundry other complaints.

This divisions Prisoners of War Fund now stands at £8/19/6. £1/6/- was collected at the December meeting, and during the month a person who does not wish his name to be published, donated £5. This, with what has been collected, makes up the £8/19/6. Any further contributions will be gratefully received by the Treasurer.

Definite news is now to hand of Snow Campbell 3MR. One of our members has recently received a letter from him. Snow is in a camp in Northern Italy (a bad spot to be in at the moment by all accounts) and to put it as it was passed on "full of beans". We hope to publish this letter in the next issue.

The morse code class manager Mr. H. N. Stevens 3JO announces that he is closing the classes over the Christmas holidays, from December 18th to the first Monday in January.

The members of the Magazine Committee are eagerly awaiting the results of a crop of potatoes planted by Mr. Bert Burdekin in accordance with the ruling of the stars. Bert informed us that he had happened to listen to "one of the leading astrologers" on the radio, and learning that the next day was absolutely the best day of the year for planting, he went out into the garden and picked the worst place he had and planted potatoes. So far there is plenty of 'top'...but is there anything underneath??

The next meeting of the division will be held in the rooms, 191 Queen Street, Melbourne, on Tuesday 5th January, when interstate visitors will be very welcome. It is hoped that a member of the R.A.A.F. who has seen active service will be able to get along and give a talk.

What has happened to the gang at L.H.Q????

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R. J. MARRIOTT, VK3SI; C. QUIN, VK3WQ.

Meeting Night—First Tuesday in each month.

THE WIRELESS INSTITUTE OF AUSTRALIA

N.S.W. DIVISION

Registered Office:

21 TUNSTALL AVENUE,
KINGSFORD

Telephone: FX 3305

Meeting Place:

Y.M.C.A. Buildings, Pitt Street, Sydney.

SUBSCRIPTION RATES:

Full Membership	10/6
Service Membership	7/6

OFFICERS:

President: R. A. PRIDDLE, VK2RA.
Vice-Presidents: H. PETERSON, VK2HP
P. DICKSON, VK2AFB
Secretary: W. G. RYAN, VK2TI
Treasurer: W. McELREA, VK2UV
Councillors: V. BENNETT, VK2VA; N. GOUGH,
VK2NG; R. SMITH, VK2AIU; R. MILLER.

The Division meets on the Third Thursday of each month at Y.M.C.A. Buildings, Pitt Street, Sydney, and an invitation is accorded to all Amateurs to be present.

H A M S !

DO YOU WANT TO BE
BACK ON THE AIR?



THE WIRELESS INSTITUTE OF AUSTRALIA

is the recognised spokesman of the
AUSTRALIAN AMATEUR

If you are not a member—
Join Now !

When the time comes that we can reasonably expect to go back on the air, we want to say that we represent—

EVERY ACTIVE HAM

in the Commonwealth.

Strengthen our hand by writing to The Secretary of the Institute in your State to-day.

DIVISIONAL ADDRESSES:

FEDERAL HEADQUARTERS:

BOX 1734JJ, G.P.O., SYDNEY.

NEW SOUTH WALES:

BOX 1734JJ, G.P.O. SYDNEY.

VICTORIA:

BOX 2611W, G.P.O., MELBOURNE.

QUEENSLAND:

BOX 1524V, G.P.O., BRISBANE

SOUTH AUSTRALIA:

BOX 284D, G.P.O., ADELAIDE.

WESTERN AUSTRALIA:

BOX N.1002, G.P.O., PERTH.

TASMANIA:

BOX 547E, G.P.O., HOBART.